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### 43. A NEW TYPE OF MIMICRY IN BUTTERFLIES

Hitherto, two types of inter-butterfly mimicry have been observed:

1. Batesian, where non-poisonous/palatable butterflies, generally females, mimic wing coloration patterns, habits and flight patterns of poisonous/non palatable butterflies. Batesian mimicry is apparent in relationships such as those between females of the Eggfly *Hypolimnas misippus* L., the Palmfly *Elymnias hypermnestra* L. on the one hand and the Plain Tiger *Anosia chrysippus* L. on the other. Similarly between the Tawny Mime *Chilasa agestor* Mo. and the Chestnut Tiger *Parantica sita* Kol.

2. Mullerian, where poisonous butterflies mimic each other's wing/body coloration in an effort to develop a warning coloration pattern easily recognisable by predators. Mullerian mimicry is prevalent among the Windmills (*Byasa dasarada* M. group), the Black Crows (*Euploea core* Cr. group) and the Blue Crows (*Euploea mulciber* Cr. group).

A strange relationship exists between the Swordtails (*Pazala eurous cashmirensis* Roth. and *Pazala glycerion* Gr.) and the Cabbage Whites (*Pieris brassicae* L. and *Artogeia canidia* Sparman).

The Swordtails are on the wing for two to three weeks in early spring, at elevations between 1250-2200 m above sea level. Their flying time coincides with the first brood of Cabbage whites. During this period, the Whites outnumber the Swordtails in a ratio of about 25:1.

During the morning hours, the Swordtails make no attempt to mimic any insect, but depend on swift flight in the upper canopy of trees to avoid predators. At midday, however, both species of Swordtails come down to 3-5 m above ground level, that is, the zone in which Cabbage Whites are predominant. At this level, they affect the much slower, fluttering, erratic flight of the Whites as opposed to their normal 'flap and glide' technique making it extremely difficult to distinguish between the mimic and the model. The reason behind this became clear when I (in the

role of predator) tried to catch them. Calculating the net's sweep according to the feigned flight of the Swordtail, I was surprised when it reacted with a series of high speed, complicated manoeuvres that on most occasions left me baffled.

Since these insects seem to be capable of reacting more swiftly than Cabbage Whites and are more alert, they generally manage to escape into the upper canopy (birds seem to be incapable of maintaining the rate of acceleration while ascending) when attacked, and, after a while, return to the lower levels to continue the mimicry. The other advantage of this form of mimicry lies in the large population of the models. The chances of being singled out for attack are considerably reduced by 'merging with the crowd'. In the case of the Swordtails, this fact is relevant since they are the only inhabitants of the upper canopy at that time of the year.

I propose to refer to this form of mimicry as Self-Detractive mimicry because the mimic actually imitates the vulnerability of the model and, after detracting from its own abilities, depends upon its true capabilities to escape predators. As opposed to this is Batesian mimicry, where the non-poisonous mimic imitates various aspects of the poisonous model in order to be considered poisonous as well. Since it is *being poisonous* that makes the model invulnerable, it is clear that the mimic imitates this invulnerable aspect of its model.

Self-detractive mimicry is also prevalent between the Sailors (Genus *Neptis*), which are the models and the Sergeant Major *Abrota ganga* Mo., the Sergeant Emperor *Apatura chevana* Mo. and the Sergeants (Genus *Athyma*, prev. *Pantoporia*) which are the mimics. It probably exists in other insect relationships, but results can only be obtained by observation of the subjects in their natural habitat.

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